

## CONTENTS

**1 Effect of aging on microstructure and mechanical properties of cobalt free 18%Ni (250 grade) maraging steel**  
P. P. Sinha, K. T. Tharian, K. Sreekumar, K. V. Nagarajan, and D. S. Sarma

**10 Kinetics of  $\gamma \rightarrow \alpha$  phase transformation in Fe–Mn alloys containing low manganese**  
G. P. Krielaart and S. van der Zwaag

**19 Dielectric behaviour of  $\text{Ni}_x\text{Mg}_{1-x}\text{Fe}_2\text{O}_4$  ferrites**  
M. A. El Hiti and M. A. Ahmed

**25 Application of control theory principles to optimisation of grain size during hot extrusion**  
W. G. Frazier, J. C. Malas III, E. A. Medina, S. Medeiros, S. Venugopal, W. M. Mullins, A. Chaudhary, and R. D. Irwin

**32 Superplasticity in doubly extruded magnesium composite ZK60/SiC/17p**  
T. Mukai, T. G. Nieh, H. Iwasaki, and K. Higashi

**36 Particle redistribution and matrix microstructure evolution during hot extrusion of cast  $\text{SiC}_p$  reinforced aluminium alloy matrix composites**  
B. Dutta, I. Samajdar, and M. K. Surappa

**47 Interface reactions in squeeze cast Saffil fibre/piston alloy composites**  
A. Papworth, A. Green, and P. Fox

**54 Effect of tungsten additions on simulated heat affected zone toughness in 25%Cr base super duplex stainless steels**  
H. Lee, C. H. Yoo, and H. M. Lee

**61 Optimisation of pulse frequency in pulsed current gas tungsten arc welding of aluminium–lithium alloy sheets**  
G. Madhusudhan Reddy, A. A. Gokhale, and K. Prasad Rao

**67 Literature Review Bore polish**  
A. K. Gondal, F. A. Davis, and T. S. Eyre

**73 Laboratory test rig simulation of bore polish**  
A. K. Gondal, F. A. Davis, and T. S. Eyre

**80 Microstructure and hardness distribution of laser surface overlap coating layer**  
G. Shi, J. Liu, P. Ding, and S. Zhou

**89 Influence of alloying additions on austempering kinetics of compacted graphite cast iron**  
B. T. Sim and R. Elliott

**97 Microstructure and tensile properties of squeeze cast SiC particulate reinforced Al–7Si alloy**  
P. A. Karnezis, G. Durrant, and B. Cantor

**108 Behaviour of low and medium carbon free cutting steels during deformation to large strains**  
M. S. Bingley and J. Nutting

**123 Microstructure and cleavage resistance of heat affected zones in high strength, microalloyed steel welds**  
P. Brozzo, M. Capurro, M. G. Ienco, and M. R. Pinasco

**129 Correlation of microstructure and tensile properties of 316 stainless steel weld metal solution annealed at high temperatures**  
H. Shaikh, T. V. Vinoy, and H. S. Khatak

**136 Approach to constitutive relationships of a Ti–5Al–2Sn–2Zr–4Cr–4Mo alloy by artificial neural networks**  
M. Li, X. Liu, S. Wu, and X. Zhang

**139 Yttria–magnesia partially stabilised zirconia reinforced with  $\text{MgAl}_2\text{O}_4$  spinel particles**  
Y. L. Ma, Q. M. Yuan, J. Q. Tan, and X. H. Zhu

**143 Transition wear behaviour of IC–50 ordered alloy**  
G. Straffelini, R. Dorigatti, and S. Gialanella

**151 Sequence of corrosion attack of machining induced flow zone produced on some Al alloys that leads to rapid intergranular penetration**  
P. J. E. Forsyth

**161 Solid particle erosion of highly porous carbon–carbon composites**  
R. I. Baxter and R. D. Rawlings

## CONTENTS

**1 Effect of aging on microstructure and mechanical properties of cobalt free 18%Ni (250 grade) maraging steel**  
P. P. Sinha, K. T. Tharian, K. Sreekumar, K. V. Nagarajan, and D. S. Sarma

**10 Kinetics of  $\gamma \rightarrow \alpha$  phase transformation in Fe–Mn alloys containing low manganese**  
G. P. Krielaart and S. van der Zwaag

**19 Dielectric behaviour of  $\text{Ni}_x\text{Mg}_{1-x}\text{Fe}_2\text{O}_4$  ferrites**  
M. A. El Hiti and M. A. Ahmed

**25 Application of control theory principles to optimisation of grain size during hot extrusion**  
W. G. Frazier, J. C. Malas III, E. A. Medina, S. Medeiros, S. Venugopal, W. M. Mullins, A. Chaudhary, and R. D. Irwin

**32 Superplasticity in doubly extruded magnesium composite ZK60/SiC/17p**  
T. Mukai, T. G. Nieh, H. Iwasaki, and K. Higashi

**36 Particle redistribution and matrix microstructure evolution during hot extrusion of cast  $\text{SiC}_p$  reinforced aluminium alloy matrix composites**  
B. Dutta, I. Samajdar, and M. K. Surappa

**47 Interface reactions in squeeze cast Saffil fibre/piston alloy composites**  
A. Papworth, A. Green, and P. Fox

**54 Effect of tungsten additions on simulated heat affected zone toughness in 25%Cr base super duplex stainless steels**  
H. Lee, C. H. Yoo, and H. M. Lee

**61 Optimisation of pulse frequency in pulsed current gas tungsten arc welding of aluminium–lithium alloy sheets**  
G. Madhusudhan Reddy, A. A. Gokhale, and K. Prasad Rao

**67 Literature Review Bore polish**  
A. K. Gondal, F. A. Davis, and T. S. Eyre

**73 Laboratory test rig simulation of bore polish**  
A. K. Gondal, F. A. Davis, and T. S. Eyre

**80 Microstructure and hardness distribution of laser surface overlap coating layer**  
G. Shi, J. Liu, P. Ding, and S. Zhou

**89 Influence of alloying additions on austempering kinetics of compacted graphite cast iron**  
B. T. Sim and R. Elliott

**97 Microstructure and tensile properties of squeeze cast SiC particulate reinforced Al–7Si alloy**  
P. A. Karnezis, G. Durrant, and B. Cantor

**108 Behaviour of low and medium carbon free cutting steels during deformation to large strains**  
M. S. Bingley and J. Nutting

**123 Microstructure and cleavage resistance of heat affected zones in high strength, microalloyed steel welds**  
P. Brozzo, M. Capurro, M. G. Ienco, and M. R. Pinasco

**129 Correlation of microstructure and tensile properties of 316 stainless steel weld metal solution annealed at high temperatures**  
H. Shaikh, T. V. Vinoy, and H. S. Khatak

**136 Approach to constitutive relationships of a Ti–5Al–2Sn–2Zr–4Cr–4Mo alloy by artificial neural networks**  
M. Li, X. Liu, S. Wu, and X. Zhang

**139 Yttria–magnesia partially stabilised zirconia reinforced with  $\text{MgAl}_2\text{O}_4$  spinel particles**  
Y. L. Ma, Q. M. Yuan, J. Q. Tan, and X. H. Zhu

**143 Transition wear behaviour of IC–50 ordered alloy**  
G. Straffelini, R. Dorigatti, and S. Gialanella

**151 Sequence of corrosion attack of machining induced flow zone produced on some Al alloys that leads to rapid intergranular penetration**  
P. J. E. Forsyth

**161 Solid particle erosion of highly porous carbon–carbon composites**  
R. I. Baxter and R. D. Rawlings

170 **Short Communication** Ultrahigh pressure consolidation (UHPC) of W–Cu composites  
S. Yoo, M. S. Krupashankara, T. S. Sudarshan, and R. J. Dowding

177 **Formation of microstructure in the Cd–In–Sn ternary eutectic**  
M. A. Ruggiero and J. W. Rutter

182 **Plane front solidification of two phase peritectic tin–cadmium alloys: Part 2**  
J. W. Rutter, M. G. Julien, and G. R. Purdy

187 **Lattice and grain boundary diffusion of copper into cladding on Alclad Al–Cu–Mg alloy sheet**  
R. C. Dorward

193 **High resolution *in situ* SEM observations of early stages of fatigue crack growth in IN 9052 aluminium alloy**  
J. Z. Zhang, M. D. Halliday, and P. Bowen

201 **Transmission electron microstructures of stainless steel strip overlay joints**  
C. Pan, A. Li, G. Shun, and M. Holmquist

206 **Micromechanisms of fatigue crack propagation in Ti<sub>3</sub>Al based alloys**  
X. Wu and P. Bowen

217 **Determination of no-recrystallisation temperature in Nb–V–Ti microalloyed steel and discussion of its definition**  
S. F. Medina

222 **Preliminary analysis of hot ductility curve in simple C–Mn steels**  
B. Mintz, R. Abushosha, and C. Cowley

227 **Influence of cooling rate and MnS inclusions on hot ductility of steels**  
R. Abushosha, S. Ayyad, and B. Mintz

236 **Effect of precursor, solvent, and water molar ratios on surface area and porosity of tetraethoxysilane silica aerogels**  
A. Venkateswara Rao, P. B. Wagh, G. M. Pajonk, and D. Haranath

241 **Relationship between mechanical properties and structure in austempered alloyed compacted graphite cast iron**  
B. T. Sim and R. Elliott

245 **Wear behaviour of 1.5Mn austempered ductile iron**  
A. Owhadi, J. Hedjazi, and P. Davami

251 **Embrittlement of brazed martensitic stainless steel**  
G. K. L. Goh and L. C. Lim

257 **Diamond fibre thermal sensor**  
P. G. Partridge, N. J. Williamson, C. J. Gilmore, and C. Preece

263 **Erosion and passivation of electrodes of a magnetoplasmadynamic thruster**  
J. J. Osborne, A. R. Chambers, N. J. Wood, and G. T. Roberts

273 **Quasichemical model for interstitial solutions**  
H. K. D. H. Bhadeshia

277 **Quantification of early stages of age hardening in Fe–12Ni–6Mn maraging type alloy**  
E. A. Wilson

283 **Effect of cyclic loading on interfacial shear stress in SiC–CAS glass ceramic matrix composite**  
R. F. Allen, A. M. Daniel, M. H. Lewis, and P. Bowen

287 **Mechanosynthesis mechanism of TiC powders**  
N. Q. Wu, S. Lin, J. M. Wu, and Z. Z. Li

292 **Fabrication of Al<sub>2</sub>O<sub>3</sub> continuous fibre reinforced Al–Cu alloys by axial infiltration process**  
H.-N. Liu, H. Miyahara, and K. Ogi

299 **High temperature Young's modulus of alumina short fibre reinforced Al–Si MMCs produced by liquid infiltration**  
H. Akbulut, M. Durman, and F. Yilmaz

306 **Effects of electromagnetic stirring and water cooling on structure and segregation in centrifugally cast Al–Si eutectic alloy**  
W. Zhang, Y. Yang, Q. Liu, Y. Zhu, Q. Zhang, and Z. Hu

312 **Effect of titanium on cast structure of high speed steel**  
Sh. Kheirandish, Sh. Mirdamadi, and Y. H. K. Kharrazi

317 Effect of predeformation on microstructure and tensile properties of Al–Mg–Si alloys with high silicon content  
L. Zhen and S. B. Kang

322 High temperature deformation behaviour of Al–Fe–V–Si alloys  
F. Carreño and O. A. Ruano

328 Effect of Si content on surface quality of extruded Al–Mg<sub>2</sub>Si system alloys  
T. Takai, N. Takatsuji, K. Matsuki, M. Tokizawa, K. Murotani, and H. Morita

333 Microstructure of friction weld interface of 1050 aluminium to austenitic stainless steel  
S. Fukumoto, H. Tsubakino, K. Okita, M. Aritoshi, and T. Tomita

339 Analysis of high temperature flow stress of titanium alloys IMI 550 and Ti–10V–2Fe–3Al during isothermal forging  
D. G. Robertson and H. B. McShane

346 Influence of cooling rate on hot ductility of C–Mn–Al and C–Mn–Nb–Al steels  
R. Abushosha, S. Ayyad, and B. Mintz

352 Microstructure and bond strength of Ni–Cr steel/Si<sub>3</sub>N<sub>4</sub> joint brazed with Ag–Cu–Zr alloy  
J. H. Kim and Y. C. Yoo

357 Use of a tungsten metal arc heat source for surface modification of Ti–6Al–4V alloy  
M. Labudovic and T. I. Khan

362 Secondary ion mass spectroscopy and surface profilometric characterisation of oxide scales developed over weld metal, heat affected zone, and base metal regions of 9Cr–1Mo steel weldments  
R. K. Singh Raman, A. K. Tyagi, J. B. Gnanamoorthy, Baldev Raj, and S. K. Roy

369 Microstructure and mechanical properties of SiC platelet reinforced ( $\alpha + \beta$ ) sialon ceramic composites  
T. Wei, Y. Zhou, T. C. Lei, and Y. D. Yu

373 Laser Raman spectroscopy: a technique for rapid characterisation of oxide scale layers  
R. K. Singh Raman, B. Gleeson, and D. J. Young

377 Restricted equilibrium phase diagram of nickel rich corner of quaternary system Ni–Cr–Fe–Mo  
T. Kraft and H. E. Exner

382 Surface topography and sputtering behaviour of Cu–6Ag and Cu–10Sn in different plasma atmospheres  
S. K. Habib, I. A. Mousa, and A. Rizk

388 Mathematical modelling of hot rolling steel strip  
R. Colás

394 New studies of nucleation mechanisms in aluminium alloys: implications for grain refinement practice  
P. Schumacher, A. L. Greer, J. Worth, P. V. Evans, M. A. Kearns, P. Fisher, and A. H. Green

405 Diffusion bonding of hot rolled 7075 aluminium alloy  
Y. Huang, F. J. Humphreys, N. Ridley, and Z. Wang

411 Experimental investigations into kinetics of recrystallisation of cold rolled nickel  
G. J. Liao, R. Le Gall, and G. Saindrenan

417 Electric, dielectric, and thermoelectric properties of zinc substituted Ni–Mg ferrites  
M. A. El Hiti and A. M. Abdeen

422 Transient liquid phase diffusion bonding of 8090 Al–Li alloy using copper interlayer  
D. V. Dunford and P. G. Partridge

429 High temperature creep behaviour of single crystal superalloy  
N. Das, M. C. Pandey, and R. N. Ghosh

435 Improvement in mechanical properties and high temperature oxidation resistance of  $\gamma$ -TiAl intermetallic compounds by boronising  
S. Kim, Y. Yoon, H. Kim, and K. Park

440 Influence of cooling rate on room temperature tensile behaviour of thermally oxidised MA 956  
J. Chao and J. L. González-Carrasco

445 Wear properties of Fe–Fe<sub>3</sub>C nanophase white iron obtained by mechanosynthesis and hot isostatic pressing  
V. Porcarelli, L. Ceschin, and P. Matteazzi

452 Effect of silicon content on transformation kinetics of austempered ductile iron  
J. Mallia, M. Grech, and R. E. Smallman

461 Investigation of fracture toughness of deep carburised M50NiL steel under different tempering temperatures  
Y. Q. Fu, Y. W. Gu, A. W. Batchelor, and W. Zhou

467 Literature review Magnesium oxide as inhibitor of hot oil ash corrosion  
S. N. Tiwari and S. Prakash

473 **Short Communication** Dimensional shrinkage of supersaturated ZA27Cu1 and ZA27Cu2 alloys  
Y. Chen and M. Tu

476 **Short Communication** Mechanical properties of Al-7Si-Mg casting alloy under various aging conditions  
J. Guo, H. Zhu, and J. Jia

---

Papers from the conference 'Layered structural materials '97'

481 **Editorial**

483 **Design of ceramic laminates for structural applications**  
W. J. Clegg

496 **Development and use of layered ferrous microstructure**  
J. A. Charles

504 **Processing and properties of interfaces in layered materials**  
K. Kendall

510 **Diffusion bonded Mokumé Gane decorative metal laminates**  
I. T. Ferguson and B. Derby

518 **Damping capacity of laminates composed of layers of titanium alloy and titanium alloy MMC**  
Y. Q. Zuo, D. J. Smith, and P. G. Partridge

522 **Fracture of epoxy bonded dynamic peel specimens containing interfacial layers**  
H. Taylor, D. L. Chadwick, and W. C. Law

527 **Processing and properties of ultrafine laminated and fibre reinforced ductile *in situ* composites**  
A. Benghalem, C. Biselli, and D. G. Morris

531 **Mapping residual stress using optical microprobe in alumina films formed by thermal oxidation of NiAl**  
A. Atkinson, D. R. Clarke, and S. J. Webb

535 **Effect of interfacial adhesion on toughness of metal/ceramic laminates**  
S. J. Howard, S. K. Pateras, and T. W. Clyne

542 **Development of surface texture in as cast lead-tin and other alloys**  
J. E. Morgan

544 **Multiscale numerical modelling of crack propagation in two-dimensional metal plate**  
H. Rafii-Tabar, L. Hua, and M. Cross

549 **Processing and properties of electrodeposited layered surface coatings**  
A. Horsewell

---

554 **Strength of friction welded ceramic-metal joints**  
R. Weiss and F. Sassani

561 **Structures and magnetic properties of overaged Fe-Al-Mn-C alloys**  
Y. C. Lin

573 **Hydrogen behaviour in aged low activation martensitic steel F82H for fusion reactor applications**  
E. Serra and G. Benamati

579 **Grain size refinement and mechanical properties of foil metallurgically processed 7475 aluminium alloy**  
H. Iwasaki, T. Mori, and K. Higashi

585 **Effects of deleterious impurities and cerium modification on intrinsic and extrinsic toughening levels of Al-Li based alloys**  
L. Meng, X. L. Zheng, J. P. Tu, and M. S. Liu

592 **Electrochemical behaviour of ion implanted Ti-6Al-4V in Ringer's solution**  
H. Schmidt, C. Konetschny, and U. Fink

601 **Contribution to ternary system Al-Ti-B**  
Part 1 - Study of diborides present in aluminium corner  
F. Zupanić, S. Spaić, and A. Križman

608 **Effect of vanadium content and annealing temperature on recrystallisation, grain growth, and magnetic properties in 0.3%Si electrical steels**  
L. Chang and Y.-S. Hwang

619 **Effect of solution treatment temperature on tensile properties of Al-7Si-0.3Mg (wt.-%) alloy**  
D. L. Zhang, L. H. Zheng, and D. H. StJohn

626 **Recrystallisation rates in austenite measured by double compression and stress relaxation methods**  
J. S. Perttula and L. P. Karjalainen

631 Prediction of plastic deformation and residual stresses induced in metallic parts by shot peening  
R. Fathallah, G. Inglebert, and L. Castex

640 Hot rolling and superplastic forming response of net shape processed Ti-6Al-4V produced by centrifugal spray deposition  
A. L. Dowson, P. Blackwell, M. Jones, J. M. Young, and M. A. Duggan

651 Fatigue crack growth in fibre reinforced titanium MMC laminate at room and elevated temperatures  
F. Brisset and P. Bowen

658 Experimental characterisation of fibre failure and its influence on crack growth resistance in fibre reinforced titanium metal matrix composites  
C. Barney, A. R. Ibbotson, and P. Bowen

669 Effect of  $\gamma$  size on room temperature low cycle fatigue behaviour of a nickel base superalloy  
V. Subramanya Sarma, M. Sundararaman, and K. A. Padmanabhan

676 Alloying effects on superplastic behaviour of Ti-Fe-Al-Ni alloys  
J. S. Kim, D. M. Li, and C. S. Lee

683 Cast M7 high speed steel modified with titanium  
Sh. Kheirandish, Y. H. K. Kharrazi, and Sh. Mirdamadi

689 Development of Mg-V alloys by physical vapour deposition  
Part 1 – Bulk and surface characterisation  
S. Diplas, P. Tsakirooulos, and R. M. D. Brydson

699 Development of Mg-V alloys by physical vapour deposition  
Part 2 – Characterisation of corrosion products formed in 3 wt-%NaCl  
S. Diplas, P. Tsakirooulos, R. M. D. Brydson, and J. F. Watts

712 Chemical reaction assisted transient liquid phase bonding of alumina in combination with cold isostatic pressing  
H. Kato and K. Kageyama

721 Cooling behaviour and microstructure of rapidly solidified Ag-Cu alloys  
T. A. El-Benawy, N. A. El-Mahallawy, M. A. Taha, and H. Fredriksson

726 Differential scanning calorimetry evidence of compositional modulation and giant magnetoelastic wave amplitude in electrodeposited Co-P ribbons  
L. Lanotte, R. Germano, V. Iannotti, A. Di Nocera, and S. Loret

732 Effect of aluminium on ordering of highly stabilised  $\beta$ -Ti-V-Cr alloys  
Y. G. Li, P. A. Blenkinsop, M. H. Loretto, and N. A. Walker

738 Morphology of  $\beta$ -AlFeSi intermetallic in Al-7Si alloy castings  
S. K. Tang and T. Sritharan

743 Strain induced grain boundary migration in boron doped Ni<sub>76</sub>Al<sub>24</sub>  
M. C. Chaturvedi, R. K. Verma, and A. K. Jena

747 Effect of stress on transformation and prediction of residual stresses  
C. C. Liu, Z. Liu, X. J. Xu, G. X. Chen, and J. Z. Wu

751 Creep behaviour of single crystal nickel base superalloy  
S. G. Tian, J. H. Zhang, H. H. Zhou, H. C. Yang, Y. B. Xu, and Z. Q. Hu

757 Effects of W substitution on  $\sigma$  and  $\chi$  phase precipitation and toughness in duplex stainless steels  
Y. H. Lee, K. T. Kim, Y. D. Lee, and K. Y. Kim

765 Hot deformation behaviour of SiC<sub>p</sub>/2024 aluminium alloy composites reinforced with various sizes of SiC<sub>p</sub>  
B. C. Ko, K. Park, and Y. C. Yoo

770 Generation of dislocations and subgrains in stir cast Al-6.2Si alloy during semisolid state processing  
J. I. Lee, G. H. Kim, and H. I. Lee

776 Computer modelling of wear resistance for plain carbon steels  
A. Basak, D. C. Reddy, and D. V. K. Kanth

783 Effects of hot deformation on austenite transformation in low carbon Mo-Nb and C-Mn steels  
V. M. Khlestov, E. V. Konopleva, and H. J. McQueen

793 Tensile properties of mechanically alloyed oxide dispersion strengthened iron alloys  
Part 1 – Neural network models  
A. Y. Badmos, H. K. D. H. Bhadeshia, and D. J. C. MacKay

810 Wear characteristics of TiC reinforced cast iron composites  
Part 1 – Adhesive wear  
R. K. Galgali, H. S. Ray, and A. K. Chakrabarti

816 Characterisation of microstructure and its effect on rolling contact fatigue of induction hardened medium carbon bearing steels  
B. Y. Choi and G. W. Bahng

822 Effect of aluminising on high temperature oxidation resistance of TiAl compounds  
S. Kim, D. Paik, I. Kim, H. Kim, and K. Park

827 Microstructural influence on sag resistance of Cr containing and Cr free spring steels  
W. J. Nam and C. S. Lee

832 Short Communication Topology of grain deformation  
S. B. Singh and H. K. D. H. Bhadeshia

835 Short Communication Hot working characteristics of Zr-2.5Nb using processing maps  
S. V. S. Narayana Murty and B. Nageswara Rao

---

Papers from the conference 'Metal matrix composites VI'

841 Editorial

843 Opportunities for new graphitic aluminium metal matrix composite  
A. E. M. Warner, J. E. Bell, and T. F. Stephenson

851 Designing metal matrix composites to meet their target: particulate reinforced aluminium alloys for missile applications  
A. J. Shakesheff and G. Purdue

857 Developing trends in disc brake technology for rail application  
T. Zeuner, P. Stojanov, P. R. Sahm, H. Ruppert, and A. Engels

864 Towards cost effective manufacturing of Ti/SiC fibre composites and components  
Z. X. Guo

873 Influence of matrix alloying elements on reactive synthesis of 2124 aluminium alloy metal matrix composites  
H. J. Brinkman, J. Duszczyk, and L. Katgerman

877 Evaluation of continuous alumina fibre reinforced composites based upon pure aluminium  
R. S. Bushby

887 Infiltration diffusional solidification: a new route for processing metal matrix composites  
F. F. Bianchi, H. N. Yoshimura, and H. Goldenstein

892 Machining MMC engineering components with polycrystalline diamond and diamond grinding  
M. W. Cook

896 Manufacture of diamond impregnated metal matrixes  
J. D. Dwan

901 Superplasticity in an aluminium alloy 2124/SiC<sub>p</sub> composite  
G. H. Zahid, R. I. Todd, and P. B. Prangnell

906 High powered Nd-YAG laser welding of SiC particle reinforced aluminium alloy 2124  
T. M. Yue, J. H. Du, and H. C. Man

913 Forging behaviour and properties of metal matrix composites based on mechanically alloyed Al-Mg-Li alloy  
B. M. Styles and P. D. Pitcher

920 Transient liquid phase bonding of 2124 aluminium metal matrix composite  
J. R. Askew, J. F. Wilde, and T. I. Khan

925 Finite element analysis of observed high strengthening in composites with regularly segregated microstructures  
H. Toda, T. Gouda, and T. Kobayashi

933 Model for consolidation of Ti-6Al-4V/SiC fibre composite from plasma sprayed monotape  
D. L. Gilmore, H. N. Han, and B. Derby

939 Heterogeneous microstructures in A356 + 15 vol.-%SiC<sub>p</sub> and in A356 alloy  
M. M. Myshlyaev, H. J. McQueen, and E. V. Konopleva

949 Influence of microstructure and texture on mechanical properties of aluminium alloy 2124 + 5%SiC particulate composites  
J. B. Shamsul, C. Hammond, R. F. Cochrane, and A. J. Shakesheff

959 Characterisation of severity of particle clustering and its effect on fracture of particulate MMCs  
A. M. Murphy, S. J. Howard, and T. W. Clyne

**969 Biaxial testing of continuous fibre reinforced aluminium tubes**  
A. S. Chen and V. D. Scott

**974 Energy absorption in calcium aluminosilicate/SiC glass ceramic matrix composite tensile tests**  
I. Puente, A. Martín-Meizoso, M. R. Elizalde, J. M. Sánchez, J. M. Martínez-Esnaola, and M. Fuentes

**980 Determination by neutron diffraction of effect of plasticity on crack tip strains in a metal matrix composite**  
M. E. Fitzpatrick, M. Dutta, and L. Edwards

**987 Experimental push out testing and analysis of fibre reinforced composites: applicability and test considerations**  
C. Y. Yue, L. L. Lee, and T. Sano

**1001 Miniature thermal cycling tests on aluminium alloy metal matrix composites**  
C. Roebuck, M. G. Gee, J. D. Lord, and L. N. McCartney

**1009 Development of novel specimens for mechanical testing of fibre reinforced titanium metal matrix composites**  
M. P. Thomas, S. Bate, J. G. Robertson, and M. R. Winstone

**1015 Aluminium based metal matrix composites for improved elevated temperature performance**  
P. D. Pitcher, A. J. Shakesheff, and J. D. Lord

**1024 Processing of Ti-SiC metal matrix composites by tape casting**  
D. M. Loble and Z. X. Guo

**1029 Modelling extrusion of 2618 aluminium alloy and 2618-10%Al<sub>2</sub>O<sub>3</sub> and 2618-20%Al<sub>2</sub>O<sub>3</sub> composites**  
M. Sauerborn and H. J. McQueen

**1039 Ultrasonically aided laser drilling of particle reinforced aluminium based composites**  
T. W. Chan, T. M. Yue, and H. C. Man

**1045 Characterisation of surface MMC layers developed in Ti-6Al-4V alloy using combination of SiC<sub>p</sub> and dilute nitrogen environment**  
B. Hu, M. S. B. Selamat, H. S. Ubhi, and T. N. Baker

**1053 Workhardening effects in SiC particle reinforced aluminium alloys**  
C. M. Styles, I. Sinclair, K. Foster, and P. J. Gregson

**1057 Extrusion modelling of 6061 aluminium alloy and particle reinforced MMCs**  
E. M. Herba and H. J. McQueen

**1065 Fatigue life predictions for notch geometries in particle reinforced metal matrix composites**  
M. R. Bache, W. J. Evans, and I. Uygor

**1070 Fracture behaviour and pullout analysis in ceramic matrix composites using modified Rosen's model**  
A. Martín-Meizoso, J. M. Martínez-Esnaola, M. R. Elizalde, I. Puente, and M. Fuentes

**1075 Comparative characterisation of damping behaviour of aluminium alloy composites produced by different fabrication techniques**  
J. B. Shamsul, C. Hammond, and R. F. Cochrane

---

**1083 Thermodynamic assessment and applications of Ti-V-N system**  
K. Zeng and R. Schmid-Fetzer

**1092 Nucleation behaviour of TiB<sub>2</sub> particles in pure Al and effect of elemental additions**  
A. E. Karantzalis and A. R. Kennedy

**1097 Nanocrystalline structure and initial permeability of annealed Fe<sub>73.5</sub>Cu<sub>1</sub>Mo<sub>3</sub>Si<sub>13.5</sub>B<sub>9</sub> alloy**  
X. Y. Zhang, J. W. Zhang, R. P. Liu, J. H. Zhao, and Y. Z. Zheng

**1101 Work hardening behaviour and subgrain size distribution of hot worked aluminium**  
I. Poschmann and H. J. McQueen

**1109 Determination of stress in ferromagnetic steel by potential drop measurements**  
H. Hognestad and A. Home

**1115 Effects of chemical composition and thermomechanical treatment on austenite to ferrite transformation in 12 wt-%Cr steels**  
J. A. Koskiemi, L. P. Karjalainen, P. G. H. Pistorius and G. T. van Rooyen

**1122 Microstructure of interfacial reaction zone in SCS-6 SiC fibre reinforced super  $\alpha_2$  composites**  
Y. Q. Yang, H. J. Dudek, and J. Kumpfert

**1127 Numerical model for microsegregation in ductile iron**  
J. Liu and R. Elliott

**1132 Effect of process variables on tensile properties of ingot processes versus strip cast iron aluminides**  
J. R. Blackford, R. A. Buckley, H. Jones, C. M. Sellars, C. Briguet, and D. G. Morris

1139 Effect of hot working variables on microstructure and properties of Fe-25Al  
J. R. Blackford, R. A. Buckley, H. Jones, and C. M. Sellars

1145 Influence of  $Ar_3$  and  $Ae_3$  temperatures on hot ductility of steels  
A. Cowley, R. Abushosha, and B. Mintz

1154 Finite element analysis of deformation behaviour in ductile matrix containing hard particles  
Ş. Yilmaz and A. Aran

1163 Comparison of methods for fracture toughness testing of thin low carbon steels plates  
Y. Marchal and F. Delannay

1169 Evolution of microstructure during high temperature low cycle fatigue of high purity aluminium oligocrystals  
S. Weiss and G. Gottstein

1175 Fabrication strain rate-stress corrosion property correlations of thermomechanically treated 15Cr-15Ni-2 2Mo titanium modified austenitic stainless steel  
H. Shaikh, P. V. Sivaprasad, T. V. Vinoy, G. Bharathi, S. Venkadesan, and H. S. Khatak

1181 Development of microstructure in isothermally forged Nimonic alloy API  
P. L. Blackwell, J. W. Brooks and P. S. Bate

1189 Wear characteristics of TiC reinforced cast iron composites  
Part 2 – Abrasive wear  
R. K. Galgali, H. S. Ray, and A. K. Chakrabarti

1194 Optimisation of supercritical drying parameters for transparent silica aerogel window applications  
A. Venkateswara Rao, D. Haranath, G. M. Pajonk, and P. B. Wagh

1203 Contribution to the ternary system Al-Ti-B  
Part 2 – Study of alloys in Al-AlB<sub>2</sub>-TiB<sub>2</sub> triangle  
F. Zupanić, S. Spaić, and A. Križman

1213 Effect of martensitic phase transformation and deformation twinning on mechanical properties of Fe-Mn-Si-Al steels  
O. Grässel and G. Frommeyer

1218 Effect of retained austenite on gas nitriding of high strength steel  
K. Hussain, A. Tauqir, A. ul Haq, and A. Q. Khan

1221 Tensile properties of mechanically alloyed oxide dispersion strengthened iron alloys  
Part 2 – Physical interpretation of yield strength  
A. Y. Badmos and H. K. D. H. Bhadeshia

1227 Development of fatigue crack closure mechanism maps  
Part 1 – Basic concepts and boundary equations  
V. K. Saxena and V. M. Radhakrishnan

1233 Development of fatigue crack closure mechanism maps  
Part 2 – Construction of maps for various materials  
V. K. Saxena and V. M. Radhakrishnan

1242 Hot isostatic consolidation and transformation of sigma phase powders  
M. Wong-Kian, M. B. Cortie, and L. A. Cornish

1249 Influence of carbide on intergranular creep rupture of type 304 stainless steel  
J. He, G. Han, S. Fukuyama, and K. Yokogawa

1257 Comparative study of fracture toughness of austempered ductile irons with upper and lower ausferrite microstructures  
P. Prasad Rao and S. K. Putatunda

1266 Technical note Aluminium based composites reinforced with alumina coated carbon fibres  
Q. Zeng

---

Papers from the '1st International Conference on Materials for Microelectronics'

1269 Fermi level pinning by metal Schottky contacts on n type GaAs  
G. Myburg, W. E. Meyer, F. D. Auret, H. Burger, W. O. Barnard, and S. A. Goodman

1273 Characterisation by TEM and X-ray diffraction of linearly graded composition InGaAs buffer layers on (001) GaAs  
F. J. Pacheco, D. Araújo, S. I. Molina, R. García, A. Sacedón, F. González-Sanz, E. Calleja, P. Kidd, and M. A. Lourenço

1279 Structural and optical investigation of GaInAs/GaAs  $\{h11\}$  structures grown by molecular beam epitaxy  
M. I. Alonso, M. Ilg, A. Mazuelas, K. H. Ploog, and M. Hohenstein

1283 Ellipsometric characterisation of ordered  $\text{Ga}_{0.5}\text{In}_{0.5}\text{P}$   
F. Alsina, M. Garriga, M. I. Alonso, J. Pascual, J. Camassel, and R. W. Glew

1286 MicroRaman and phase stepping microscopy analysis of growth defects in GaAs/GaAs epilayers  
P. Martín, J. Ramos, J. Jiménez, L. F. Sanz, and M. A. González

1291 Temperature dependence of AlInAs band gap energy and AlInAs/InP band offsets  
P. Abraham, M. A. Garcia Perez, T. Benyattou, G. Guillot, M. Sacilotti, and X. Letartre

1295 Low temperature anneal of electron irradiation induced defects in p type silicon  
M.-A. Trauwaert, J. Vanhellemont, H. E. Maes, A.-M. Van Bavel, G. Langouche, and P. Clauws

1299 Defect compensation at the interface between directly bonded silicon wafers  
A. Laporte, L. Lescouzères, A. PeyreLavigne, and G. Sarrabayrouse

1303 Infrared response of epitaxial and polycrystalline  $\text{CoSi}_2$  Schottky diodes  
E. Roca, K. Kyllesbech Larsen, S. Kolodinski, and R. Mertens

1307 Defect induced shortening of excess carrier lifetime in single period nipi structures  
G. Span, J. Oswald, and G. Heigl

1314 Analysis of Bragg reflectors by lateral photoluminescence spectroscopy  
S. Gramlich, J. Sebastian, and M. Weyers

---

**Book reviews**

pages 85, 270, 1200

**Conference diary**

pages 87, 175, 271, 367, 479, 599, 719, 839, 1081, 1201, 1317

**Corrigenda**

pages 176, 838

